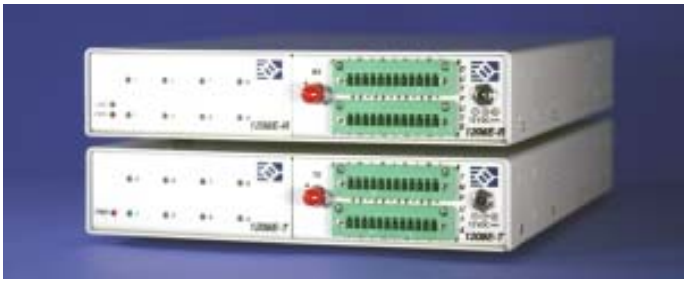
1200E Series

Fiber Optic
Serial Digital Audio Transport System



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BROADATA COMMUNICATIONS, INC.

SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS

PLEASE OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AS OUR PRODUCTS CONTAIN

CLASS I LASER PRODUCTS

WARNING

Do not disconnect the fiber optic connector while the unit is powered up. Exposure to laser radiation is possible when the laser fiber optic connector is disconnected while the unit is powered up.

Although the fiber optic connectors in this product emit only Class 1 energy that is below the levels considered to be hazardous, one should never stare directly into a fiber optic connector or an unconnected fiber end unless one can be certain that no exposure to laser energy could occur.

CAUTION

This manual is intended for use by trained service personnel. The use of controls, making adjustments, or performing operations other than those specified may result in hazardous radiation exposure.

The following label or equivalent is located on the surface of laser products. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1.0 PRODUCT DESCRIPTION

The 1200E Series is a high performance, yet affordable, Fiber Optic Serial Digital Audio Transport System. The standard 1200E system is designed to transport four (4) or eight (8) channel AES/EBU serial digital audio signals over long distance through either singlemode or multimode fiber. The 1200E design accepts synchronous or asynchronous AES/EBU channels of 44.1 or 48 kHz frequency and many versions of optical transmitter and receiver combinations are available to address different distance requirements.

Because of the use of advanced digital fiber optic transmission technology, no user adjustments are required in the 1200E system, enabling quick setup and trouble-free operation. The 1200E is designed for compliance with AES3-1992 (ANSI S4.40-1992, IEC 958), a standard format and protocol for serial transmission of digital audio.

The 1200E comes with two packaging options: a rugged, standalone, and compact unit, or a plug-in card for a card cage system. Panel connectors are provided for digital serial audio (terminal block connector) and fiber connection (FC-type for the singlemode version, or ST-type for the multimode version). The 1200E can be easily monitored by front panel LED indicators for power, optical link, and channel activity.

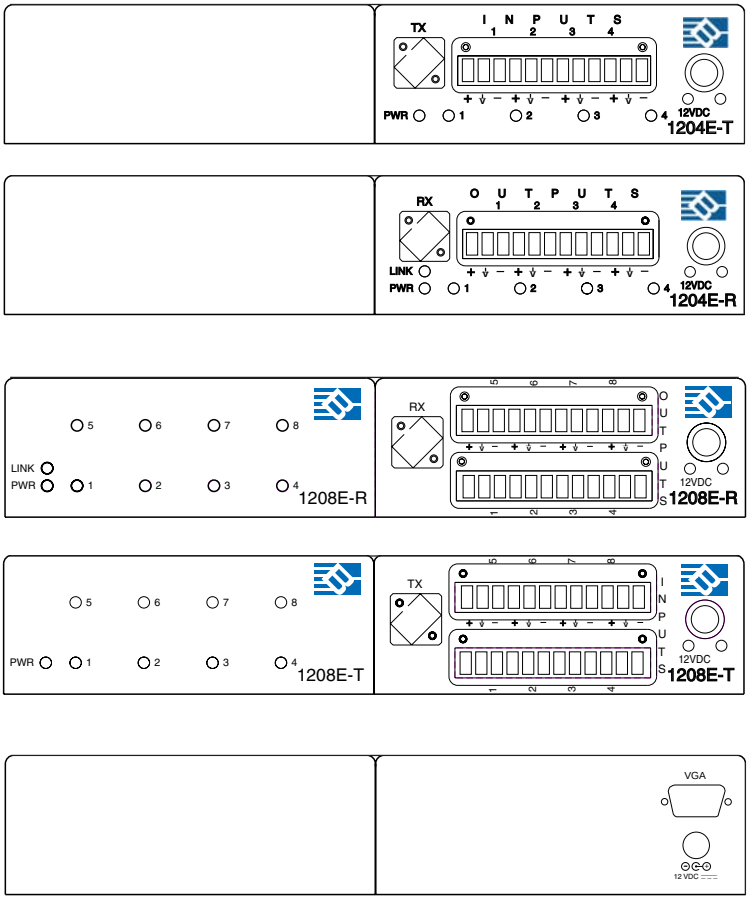

Figure 1-1
1200E Front/Rear Panels

2.0 SETUP

The BCI 1200E Series units are used in pairs. In a bi-directional application, one 1200E transceiver unit is located at the near-end and connected through two optical fibers to an identical 1200E transceiver located at the far end of the link. Each unit provides a separate electrical interface connector for each audio channel. Connections are one to one between both units. In a unidirectional application, a 1200E transmitter (1200E-T) is located at the near-end and connected through one fiber to a 1200E receiver (1200E-R) located at the far-end. Figure 2-1 depicts a typical installation.

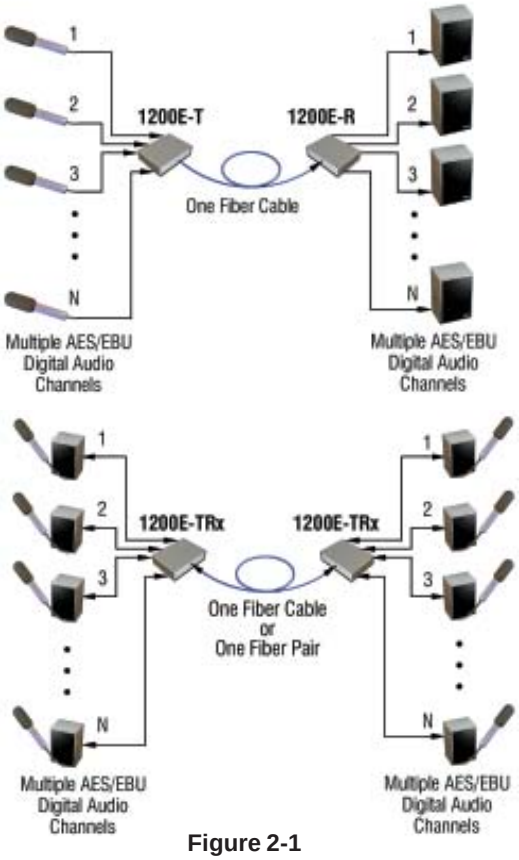

Figure 2-1
1200E Setup

2.1 Cabling and Connectors

In order to setup the BCI 1200E properly, make sure to observe the following instructions when installing the proper cables. The 1200E requires two parts to the cabling setup: the electrical and the optical. For the optical part, observe the following procedures, as there are various types of optical connectors as illustrated on the following page.

2.1.1 Electrical Cable Connection

The only available cable connections on the electrical side are for audio sources.

Proceed with the following instructions when connecting the various electrical devices.

2.1.1.1 Audio Connection

Perform the following steps to insure a proper audio connection:

1. At the near end (the transmitter unit), connect the user's audio sources to the 1200E unit's audio input ports. (See Figure 2-2).

2. At the far end (the receiver unit), connect the user's audio receivers to the corresponding audio output ports on the 1200E receiver unit.

3. Terminal block connectors are provided for the audio feeds (see Figure 2-2). Figure 2-3 illustrates the terminal block pin assigment for the 1204E (Figure 2-3(a)) and 1208E (Figure 2-3(b)).

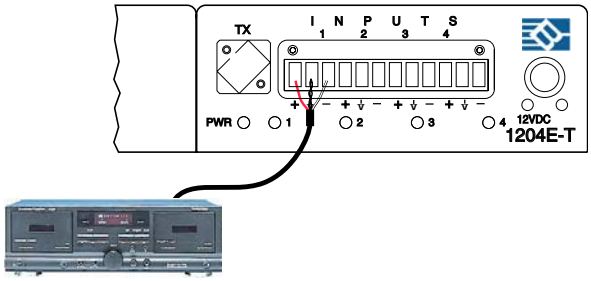

Figure 2-2
Audio Connection

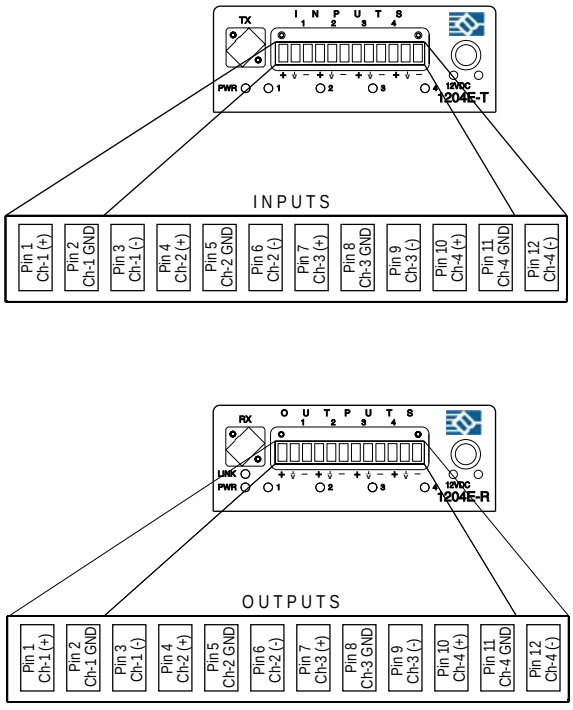

Figure 2-3(a)
Terminal Block Pin Assignment for 1204E

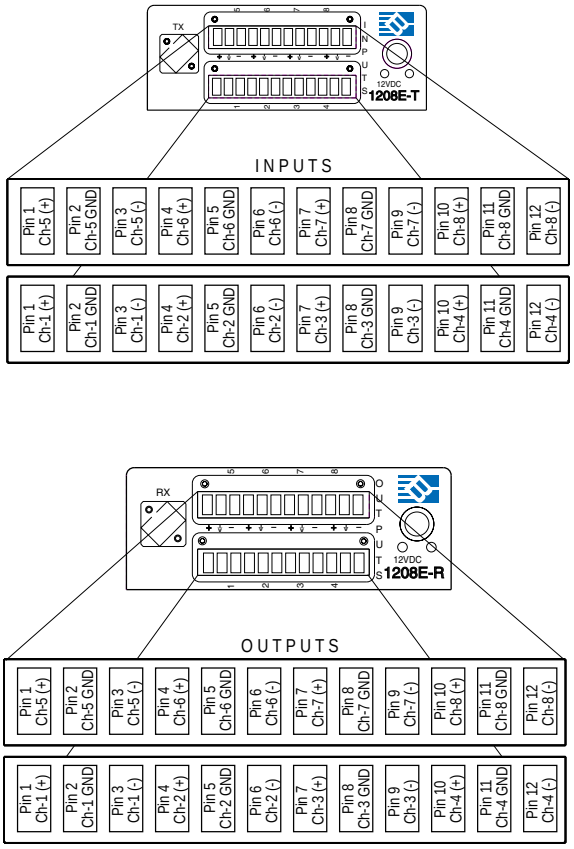

Figure 2-3(b)
Terminal Block Pin Assignment for 1208E

2.1.2 Optical Fiber Connection

Most cable manufacturers identify individual fibers in the fiber cable. Select an appropriate terminated fiber. Each unit's optical ports in the system are specified for use with Multimode (62.5/125 micron) fiber, or Singlemode (9/125 micron) fiber. Follow the ensuing instructions for installing and connecting the fiber optic links:

1. Ensure the power is off before proceeding with the fiber optic cable installation.
2. Prior to connecting the fiber optic cables, remove and save the dust caps from the optical port of both the 1200E units and the user's device. Clean the fiber optic connector and use a lint-free cloth dampened with alcohol to thoroughly wipe the side and end of the ferrule. Table 1 shows the connection mechanisms for ST, FC and SC connectors.
3. Cross-connect the fibers from one unit to the other connecting the near end 1200E unit's optical TX port to the far end 1200E unit's optical RX port as illustrated in Figure 2-4. Observe the type of connector you have and connect the optical connector by following the instructions and guidelines from the legend provided in Table 1.

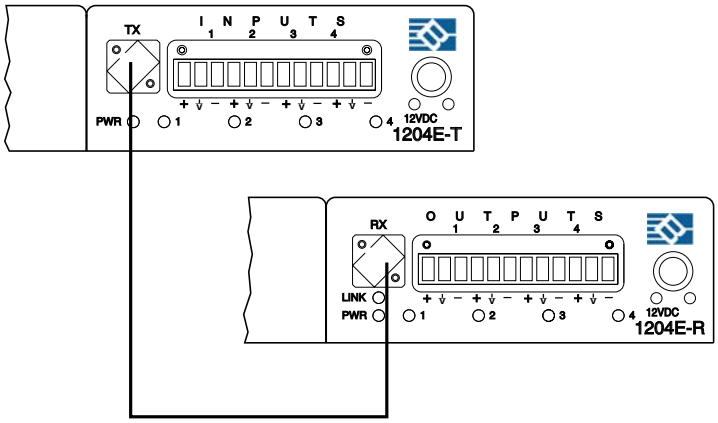

Figure 2-4
Fiber Optic Connection

Connector	Illustration	Description
ST	ST Connector	Hold the connector by the strain-relied boot* and insert the connector ferrule into the port. Rotate the boot until the "key" engages in the slot of the coupling. Push the connector housing forward until it can be turned clockwise to latch to the port.
FC	FC Connector	Hold the connector by the strain-relied boot* and insert the connector ferrule into the port. Rotate the boot until the "key" engages in the slot of the coupling. Push the connector housing forward and screw clockwise until it is tight.
SC	SC Connector	Hold the connector by the connector casing* and insert the connector into the port. Make sure the key, signified by the notch on one side of the connector aligns with the connector on the fiber optic equipment.

Table 1
Fiber Optic Connector Legend

2.2 Power Connection

Congratulations! You are now ready to power up the BCI 1200E and set up your network connection. In order to make sure that you have a proper installation, please observe the following:

1. Your AC jack has power.
2. Your electrical system has proper grounding (this ensures that your power supply does not suffer from voltage variations).
3. **Power Surge Protection. This is optional**, but highly recommended. A UPS system provides voltage regularity as well as prevents spikes from occurring, thus protecting your 1200E from sensitive voltage conditions.

The 1200E derives power from an external 12 VDC @ 1 Amp power supply. This power supply comes standard for the 1200E unless otherwise specified.

To provide power to the 1200E, simply connect the power cord, already provided with the units, and connect it to the wall jack. (You will find one power cord per unit). Once the power supply has been connected to the wall jack, connect the other end to the unit and turn the switch on (I).

If you have any problems or concerns, regarding the installation, make sure that you have taken the proper steps to ensure a proper power connection. Otherwise, feel free to contact us for any questions you may have.

3.0 OPERATION

After the installation procedure is completed, the units are ready for operation. To operate the BCI 1200E units, simply apply power as indicated in the previous step. Note that the front panel link status indicator, shown in Table 2 will be activated.

4.0 MAINTENANCE AND TROUBLESHOOTING

4.1 Maintenance

There is no operator maintenance other then keeping the units clean. However, observe the following light indicators to make sure that the unit is working properly:

Power (TX)	This RED LED indicates that the 1200E transmitter unit has power, and that the audio section is working.
Power (RX)	This RED LED indicates that the 1200E receiver unit has power, and that the audio section is working.
Link (RX)	The GREEN LED indicates that the fiber optic cable on the 1200E is properly connected and that an optical link has been established.
1, 2, . . . 8 (TX, RX)	The GREEN LED indicates that the 1200E is receiving an audio signal from the corresponding user's audio sources, for each channel.

Table 2
Status Indicators

4.2 Troubleshooting

If the BCI 1200E units do not operate properly after installation, check for possible cable breaks, loose connections, and incorrect cable connections. If a problem exists on the fiber link, please check your fiber connectors for improperly cleaned fiber cables and connectors. If problems persist that may be fiber related, contact BCI at 1-800-214-0222 for further assistance.

For electrical problems, perform the following troubleshooting procedures:

1. **If the POWER indicator is OFF, check for the following:**

   a. The line cord is plugged into the unit and your outlet has power.

   b. The 1200E unit is switched on.

   c. Check for blown fuses (located in the rear panel-entry module).

2. **If the POWER indicator is ON, but the Optical Link indicator is OFF, check for the following:**

   a. Make sure the appropriate (Singlemode or Multimode) fibers are being used.

   b. Fiber and fiber connectors are not broken. Ensure that the optical loss does not exceed the specified optical power attenuation (see Section 5.0 Specifications for the optical power budget).

   c. For each unit, the transmit (TX) fiber is connected to the other unit's receiver (RX).

3. **If the POWER indicator and Optical Link indicator are ON, but the audio/video channels are not operating, then:**

   a. Check to see that the attached user equipment is turned on.

   b. Both ends of the link are connected to the corresponding equipment and to the same corresponding channel port.

   c. Cable connections at both the video/audio channels are securely fastened to each connector. Turn the power off, then back on to reset the link.

   d. Output levels of the user's video and audio sources are not above the allowed input levels of the 1200E units (see Section 5.0 Specifications).

5.0 SPECIFICATIONS

Digital Audio

Signal Format	AES/EBU under AES3-1992 (ANSI S4.40-1992, IEC 958)
Channel Capacity	4 or 8
Signal Resolution	24 bits per channel
Audio Sampling Rate	44.1 KHz, 48 KHz
Input/Output Impedance	110 Ohms or 75 Ohms
Jitter	< 20 ns
Signal Level	2.3 Vp-p (110 Ohms) 0.9-1.1 Vp-p (75 Ohms)
Connector	Terminal Block

1200E Edge Support*

Audio Conversion	Analog-to-Digital or Digital-to-Analog Audio

*Please refer to 1200E-Edge data sheet for detailed technical specifications.

Physical

Dimension: (H x W x D)	
Standalone Unit	1.72" x 8.60" x 12.00" (1204 & 1208 unidirectional) 1.72" x 19.00" x 12.00" (1208 bi-directional)
Card-cage Plug-in Card	5.24" x 0.94" x 11.6"

Physical (Continued)

Power Level	12 VDC @ 1A
Operating Temperature	0 to +50°C
Humidity	0 to 95% RH, non-condensing
Status Indicators	Power, Optical Link, Audio Activity

Optical

Fiber Type	Multimode and Singlemode
Number of Fibers	2 or 1
Wavelength	1310 and/or 1550 nm
Fiber Optic Connector	ST (Multimode) FC (Singlemode)

6.0 SERVICE PROCEDURE

6.1 Replacement Policy

Standard products found defective on arrival (DOA) will be replaced, based on availability, within 24 to 48 hours anywhere in the U.S. Please call Customer Service at **800-214-0222** for information.

6.2 Return/Repair Service

The BCI 1200E System contains no user serviceable components. If you have a problem with your unit, please contact the Customer Service Department. To facilitate our return/repair processing please contact Broadata Communications, Inc. to obtain a Return Material Authorization (RMA). Please include the following information:

- Product model number
- Serial Number
- Complete description of problem
- Hardware installation description

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Torrance, CA 90505
1-800-214-0222
(310) 530-1416
(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

7.0 LIMITED WARRANTY

Broadata Communications, Inc. (BCI) warrants, for a period of one year from date of shipment, each product sold shall be free from defects in material and workmanship. BCI will correct, either by repair, or at BCI's election, by replacement, any said products that in our sole discretion prove to be defective and are returned to the manufacturing location within 30 days after such defect is ascertained. All warranties are limited to defects arising under normal use and do not include malfunctions or failure resulting from misuse, abuse, neglect, alterations, electrical power problems, usage not in accordance with product instructions, improper installation, or damage determined by BCI to have been caused by the Buyer or repair made by a third party. Limited warranties granted on products are to the initial customer end-user and are not transferable. OUR LIABILITY UNDER THIS WARRANTY SHALL IN ANY CASE BE LIMITED TO THE INVOICE VALUE OF THE PRODUCT SOLD AND BCI SHALL NOT BE LIABLE TO ANYONE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM THE USE OF ITS PRODUCTS OR THE SALE THEREOF. We make NO WARRANTY AS TO THE MERCHANTABILITY OF ANY GOODS, OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE OR END APPLICATION NOR DO WE MAKE ANY WARRANTY, EXPRESSED OR IMPLIED OTHER THAN AS STATED ABOVE.

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